

ABSTRACT

A two step preparation for hydroxy carboxylic acid (e.g. lactic acid) is disclosed. An enol ester (e.g. vinyl acetate) is carbonylated in the presence of a hydroxyl compound (e.g. methanol) using a palladium catalyst having one or more O-, N- and/or P- containing ligands (e.g. $\text{PdCl}_2(\text{PPh}_3)_2$), and a solvent at 50-150°C/50-2000 psig to yield hydroxy ester (e.g. methyl lactate) and acetoxy ester (e.g. methyl-2-acetoxy propionate). The second step involves hydrolyzing the products of the carbonylation step using acid catalysts (e.g. TsOH, aq HCl, resin) at 10-125°C to produce 2-hydroxy carboxylic acids (e.g. lactic acid). The carbonylation and hydrolysis catalysts may be separated and recycled.